

THE EFFECT OF PERFORMANCE BASED GRANT ON  
RESEARCH AND DEVELOPMENT AT PAKISTANI PUBLIC  
UNIVERSITIES

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A thesis submitted in  
fulfillment of the requirement for the award of the  
Degree of Doctor of Philosophy

Faculty of Technology Management and Business  
Universiti Tun Hussein Onn Malaysia

DECEMBER 2019

I would like to dedicate this work to my beloved grandfather Mr. Din Muhammad (Late), Mr. Muhammad Latif (Late) and beloved teacher Mr. Muhammad Aslam (Late) for their endless love, prayers and support in all endeavors of my life. Without of them, none of my success would be possible.

I would also like to dedicate this work to my beloved parents, Mr. & Mrs. Altaf Hussain who have always motivated me, supported me both morally and financially and always pray for my success. Without their endless prayers, moral support and encouragement, the completion of this study would not have been possible. Their sacrifices for staying away from me for very long time is also appreciable and that became my high motivation to complete this study so that we can meet as soon as possible.



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## ACKNOWLEDGMENT

In the name of Allah S.W.T, The most Gracious and The Most Merciful. All praise to Allah S.W.T for providing me guidance, strength and the ability to successfully accomplish my PhD, Alhamdulillah. Peace and Blessings be upon Prophet Hazrat Muhammad ﷺ and the believers who followed His path to the Day of Judgment. Throughout the entire process of the development and implementation of my PhD research, I have been very fortunate to have a number of wonderful and experienced people around me.

First and foremost, I would like to express heartiest thanks to my respectable supervisor Associate Professor Dr. Abd Rahman bin Ahmad whose encouragement, guidance and continuous support enabled me to carry out this research work. My heartiest appreciation for his humble behavior and kind nature.

I would like to convey my deepest gratitude and thanks to my dearest uncle Prof. Dr. Muhammad Akram who continuously supported and encouraged me during my whole life. I am thankful to my teachers, relatives and family members specially my nieces Sidra Shahbaz, Aysha Shahbaz and nephew Mudassir Ahmed for their prayers and encouragement.

I would like to extend my sincere gratitude to all my friends' circle, especially Asst. Prof. Dr. Muhammad Mujtaba Asad, Asst. Prof. Dr. Fahad Sherwani and all others whom I have not mentioned. I am absolutely grateful to all of them.

My sincere thanks to the officers of Research and Development and finance departments of Higher Education Commission of Pakistan for their guidance, support and provision all required facilities/data for accomplishing this work.

Finally, words cannot express my gratitude and thanks to the office of Research Management Centre (RMC), of Universiti Tun Hussein Onn, Malaysia (UTHM), for offering me the post of Graduate Research Assistant under the Graduate Researcher Incentive Scheme of Geran Insentif Penyelidik Siswazah (GIPS). Also, I would like to express my gratitude to all the academic and non-academic staff of my faculty (FPTP) and university for their cooperation and moral support.

## ABSTRACT

Higher education sector of every country has a significant contribution in the development of the society. Similarly, it plays a vital role in the research and development for the prosperity and improvement in social and educational settings. Furthermore, R&D lies under the higher education sector of education system. Government and universities are usually responsible to provide funds and opportunities to facilitate the research progress. But, the education system cannot run if the aforementioned authorities fail to provide sufficient funding. However, since the last few years government of Pakistan has deducted and reduced the performance grant and development budget, which were allocated for higher education institutions. Therefore, this study focused on the performance based grant which is allocated on the base of research outcome of the universities. This research has been conducted to analyze the effect of performance based grant in Pakistani public universities and its impact on research and development performance. Meanwhile, it's also determined the relationships between performance based grant and R&D performance through the mediating role of goal conflict and information asymmetry. Agency theory is used to support this research as a theoretical framework which aids to analyze the relationship between government (Principal) and the universities (agents) in the context of higher education. In this study both qualitative and quantitative research approaches have been adopted, by implying an exploratory sequential design. Firstly, the qualitative data have been collected through semi-structured interviews from head of departments and treasury officers of Pakistani public universities. On the other hand, the survey questionnaire for quantitative data collection was designed based on the results which acquired through the qualitative approach and from the previous research. The quantitative data was analyzed by using statistical Package for social science (SPSS) version 23 and Smart PLS 3.2.7, Partial Least Square Structural Equation Modeling software. This research study facilitates the HEC office (policy makers, finance officers etc.) regarding the validity, effectiveness and utilization of performance based grant to examine the effects on R&D performance in higher education sectors.

Similarly, the findings of this research indicated that by decreasing the conflicts and uncertainties between the institutions under higher education commission of Pakistan for improving the quality of teaching and outcome based research.



## ABSTRAK

Sektor pengajian tinggi memainkan peranan dan sumbangan yang sangat signifikan dalam pembangunan sesebuah negara. Malah, tidak dapat dinafikan antara aspek penting sektor ini ialah dalam bidang penyelidikan dan pembangunan (R&D) bagi meningkatkan kemakmuran pendidikan dan persekitaran sosial. Secara lazimnya, kerajaan dan institusi pengajian tinggi bertanggungjawab bagi menyediakan dana dan peluang untuk memudahkan aktiviti penyelidikan dilakukan. Namun begitu, kerajaan dan agensi tertentu kebiasaannya gagal untuk menyediakan dana yang mencukupi bagi tujuan R&D. Oleh yang demikian, sejak beberapa tahun yang lalu negara Pakistan telah membuat potongan geran dan bajet pembangunan, dimana telah di peruntukkan oleh institusi pengajian tinggi. Sehubungan itu, kajian ini bertujuan untuk meneroka kesan pendanaan R&D berasaskan prestasi yang diperuntukkan atas ke atas aktiviti tersebut di universiti awam di Pakistan. Selain itu, kajian ini bertujuan untuk melihat kesan antara geran berasaskan prestasi dan prestasi R&D dengan mediating maklumat asimetri dan konflik matlamat terhadap prestasi penyelidikan di Pakistan. Teori agensi digunakan untuk menyokong kajian ini sebagai kerangka teoretikal yang membantu untuk menganalisis hubungan antara kerajaan dan di universiti dalam konteks pendidikan tinggi. Bagi tujuan tersebut, pendekatan penyelidikan kuantitatif dan kualitatif digunakan dalam kaedah reka bentuk kajian ini. Pada mulanya, temu bual separa berstruktur dilakukan dengan melibatkan Ketua Jabatan dan Pegawai Kewangan universiti awam di Pakistan bagi tujuan pengumpulan data. Setelah itu, borang soal selidik telah di reka bentuk berdasarkan keputusan yang diperoleh melalui pendekatan kualitatif dan dari kajian-kajian lepas. Data kuantitatif dianalisis dengan menggunakan perisian SPSS versi 23 dan Smart PLS 3.2.7. Kajian mendapati dengan mengurangkan konflik dan ketidaktentuan antara institusi-institusi di bawah Suruhanjaya pendidikan tinggi di Pakistan kualiti pengajaran dan penyelidikan dapat ditingkatkan sesuai dengan pencapaian dan hasrat yang telah ditetapkan oleh pihak Kerajaan Pakistan terhadap universiti Awam mereka. Kajian ini memberi manfaat kepada HEC (pembuat polisi, pegawai kewangan dll) berhubung kesahihan,

keberkesanan penggunaan geran penyelidikan berasaskan prestasi untuk meningkatkan prestasi R&D dalam pendidikan tinggi. Selain itu, penemuan kajian ini juga menunjukkan bahawa dengan mengurangkan konflik dan ketidakpastian di antara institusi di bawah suruhanjaya pendidikan tinggi Pakistan dapat meningkatkan kualiti pengajaran dan penyelidikan berasaskan kepada hasil.



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## LIST OF ABBREVIATIONS

<i>AVE</i>	-	Average Variance Extract
<i>CB-SEM</i>	-	Covariance-Based Structural Equation Modeling
<i>CFA</i>	-	Confirmatory Factor Analysis
<i>CR</i>	-	Composite Reliability
<i>DAI</i>	-	Degree Awarding Institutes
<i>EFA</i>	-	Exploratory Factor Analysis
<i>EU</i>	-	European Union
<i>FDP</i>	-	Faculty Development Programs
<i>GAT</i>	-	Graduate Assessment Test
<i>GDP</i>	-	Gross Domestic Product
<i>GIPS</i>	-	Geran Insentif Penyelidik Siswazah
<i>GOF</i>	-	Goodness of Fit
<i>HEC</i>	-	Higher Education Commission
<i>HEIs</i>	-	Higher Education Institutions
<i>HODs</i>	-	Heads of Departments
<i>HTMT</i>	-	Heterotrait-Monotrait Ratio of Correlations
<i>IMF</i>	-	International Monetary Fund
<i>MTDF</i>	-	Medium Term Development Framework
<i>ML</i>	-	Maximum Likelihood
<i>NCEAC</i>	-	National Computing Education Accreditation Council
<i>ORIC</i>	-	Offices of Research, Innovation and Collaboration
<i>PAF</i>	-	Principal Axis Factoring
<i>PBG</i>	-	Performance Based Grant
<i>PBRF</i>	-	Performance-Based Research Fund
<i>PCA</i>	-	Principal Component Analysis
<i>PEC</i>	-	Pakistan Engineering Council
<i>PERN</i>	-	Pakistan Education & Research Network

<i>PLS-SEM</i>	-	Partial Least Square Structural Equation Modeling
<i>PMDC</i>	-	Pakistan Medical & Dental Council
<i>RAE</i>	-	Research Assessment Exercise
<i>R&amp;D</i>	-	Research and Development
<i>SPSS</i>	-	Statistical Package for the Social Sciences
<i>UGC</i>	-	University Grants Commission
<i>VAF</i>	-	Variance Accounted For



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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

All over the world, higher education institutions play an effective role for the development of societies by providing knowledgeable societies which leads to the economic growth. While, for the development of higher education funding is considered as the most important element or factor. In modern era, several developing countries have prioritized the development of their higher education system and this trend is increasing day by day (Zaheer & Zia, 2013). But before the last decade, most of the developing countries have been emphasizing only on their secondary and primary level education, that caused gradual reductions in the funds prescribed to higher education (Khan, Bhatti, & Eden, 2016). Similarly, Pakistan is one of those developing countries where such problems persist in providing sufficient funds to public higher education institutions. While, the public Universities of Pakistan have whole expansion spending of Rs, 400 million approximately, whereas, the government has distributed/allocated less than 0.2 percent of Gross Domestic Product (GDP) i.e. 400 USD per student per year until year 2009; this was noticed as one of the lowest grant level around the world at that time. In recent years, the government of Pakistan is particularly concentrating to overcome this problem in the distribution of funds by increasing the aforementioned budget from Rs. 400 million to Rs. 39 billion in year 2013. The existing budgetary allocation has therefore significantly improved in Pakistan as compared with other developing countries of the World (HEC, 2013a; Khan *et al.*, 2016; Naqvi, 2005).

In 2002, Higher Education Commission (HEC) was established by the government of Pakistan to look through the matters in order to promote research and

development according to the indigenous needs of the country. Accordingly, HEC has introduced a “grant formula” in order to distribute the total budget which is allocated by the government of Pakistan for public universities. This formula is divided into three categories which include (1) Base grant; (2) Need Grant; and (3) Performance Grant. Performance based grant budget is allocated in specific portions of the total higher education budget based on the specific performance measures such as faculty development programs (FDP), research programs and competitive research grant etc. (Ahmed, 2014; HEC, 2011a). The performance grant is particularly concerned with the performance of universities or higher education institutions. The relative objectives include, to utilize the appropriate budget allocated for Research and Development (R&D), universities’ career, degree completion and to promote courses, which are evaluated by the HEC. However, the structure of performance grant incorporates both performance metrics and student enrollment for the progress of public universities and to meet the ascribed objectives. The grant system of higher education depends on objective oriented funds. The funds are granted to the institutions when the targeted objectives are full filled (Ahmad, Soon, & Yee, 2016; Miao, 2012).

Research and Development (R&D) plays a very important role for the achievement of the latest information within the specific area of interest. The economic as well as scientific development and social stability of the country is directly associated with the R&D (GOP, 2012-2013). Hence, it is extremely needed to promote the research culture regardless of public and private universities and provide high quality facilities in industrialization-based research, import replacement and export improvement. Due to this reason, the most important purpose of public universities is to carryout cutting-edge research in all areas such as Engineering, Science, Humanities and Social science. But unfortunately, very limited resources are available in Pakistan to promote the research culture. While, the Higher Education Commission (HEC) has taken some significant measures to improve the role of the R&D in higher education sectors (GOP, 2013-2014; HEC, 2017).

The new performance-based grant strategy of HEC fully supports the modern research and rewards the first class researchers. It encourages the universities for the valuable collaboration, expanding their research capacity and also offers ability to progress. The performance-based grant is also approachable to modify improve the researcher’s requirements and to provide research environment to the researchers. The

grant is provided for different research programs, functioning situations and to improve the ability levels of the research students and researchers (HEC, 2017).

## 1.2 Research Background

In recent years, many countries have extended their competitive-project-grants in the higher education segment, while at the same time, decreased the block-grants (Newman, Couturier, & Scurry, 2010; Washburn, 2008). Performance-based grant and competitive methods have a tendency to enhance transparency and communication for financial requirements, promote effectiveness and efficiency of the universities' activities as a result enhancing the universities impact and output (Geuna & Martin, 2003; Lepori, Benninghoff, Jongbloed, Salerno, & Slipersaeter, 2007).

Performance-based grants are the key indicators for further success and depends on a formula which utilizes the performance indicators to develop a unanimous decision about the actual grant amount (Ahmad *et al.*, 2016; Rabovsky, 2012). The dependency theory mentions that the grant of the public universities and colleges are essentially dependent on the state appropriations. Therefore, the government has decided to take the essential steps to maintain and improve their institutional grant (Harnisch, 2011). Miao (2012) and Ahmad and Farley (2014) has recognized three models of performance grant and they are currently in operation in United States such as 1) performance contracts, 2) output-based grant formula, and 3) performance set-asides

Performance contracts between the government and the individual universities present a choice for performance grant models. In this model, grant is rewarded but the public universities upon performance convene the arranged objectives set onward in the agreement (Miao, 2012). Output-based grant formulas present economic motivations for optimistic development in special measurements. Frequently powered for institutional assignment, the public universities to enhance their whole misappropriations via enhanced performance on acknowledged metrics. Performance set-asides preserve a proportion of the government grant to be rewarded to high performing institutes. The reserve money may be a part of the yearly based misappropriation or the part of separate extra grant. Community universities contribute

with each other for the preserve grant by getting a targeted conclusion of performance situation before starting the year (Miao, 2012; Yee, 2019).

Performance based grant is rewarded according to the outcomes of definite performance indicators that reveal institutional improvement toward both country goals and institutional mission (Harnisch, 2011). While a results-based model and performance-based grant considers their achievements and outcome in preference to contribute. Present performance grant models include indicators of as a minimum two kinds: progress outcomes and general outcomes (Harnisch, 2011; Miao, 2012). The important features already mentioned in the literature reveals (Dougherty & Reddy, 2011; Harnisch, 2011; Miao, 2012) that performance-based measures have been developed over time to incorporate indicators mentioned in Table 1.1.

Table 1.1: Types of Performance Indicators  
Source: Dougherty & Reddy (2011), Harnisch (2011), Miao (2012)

Grant	Criteria / Indicators
General Outcomes Indicators	Graduation rate, number of degrees/certificates awarded per FTE, number of degrees/certificates awarded, students' success on licensing exams, research or grant funding awarded, job placement rates;
Progress Outcomes Indicators	Number of students graduated, number of students who transfer to a four-year institution, developmental course completion;
Subgroup Outcome Indicators	First-generation students, nontraditional students, low-income status, at-risk status, minority group identification;
High-need Subject Outcome Indicators	Nursing, STEM fields and job placement rates in high-need fields.

Similar performance indicators are employed by HEC to assess the performance of Public Universities in Pakistan. Where, student enrollment, faculty to student ratio, faculty development programs and research programs etc. are some of the most targeted performance indicators that are emphasized by HEC to increase the performance of the institutions. This grant system is globally considered as most suitable for enhancing the performance of the universities and relative transparency. Unfortunately, Pakistani public Universities lack to follow the aforementioned performance indicators and struggle to achieve the subsequent relative annual targets. Consequently, the performance-based grant to those Higher Education Institutions (HEIs) decrease which result in the lack of provision of facilities to those institutions (Ahmed, 2014; GOP, 2011-2012).

Another reason is that the quality of education has decreased continuously because of the present system of higher education in Pakistan does not properly



## REFERENCES

- Abad, D., Cutillas-Gomariz, M. F., Sánchez-Ballesta, J. P., & Yagüe, J. (2018). Does IFRS Mandatory Adoption Affect Information Asymmetry in the Stock Market? *Australian Accounting Review*, 28(1), 61-78.
- Abbasi, K. (2017). HEC received only Rs8.6bn of allocated Rs22bn budget. , *Dawn News Paper*. May 23.
- Abbott, M., & Doucouliagos, C. (2003). The efficiency of Australian universities: a data envelopment analysis. *Economics of Education review*, 22(1), 89-97.
- Acedo, F. J., & Jones, M. V. (2007). Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms. *Journal of World Business*, 42(3), 236-252.
- Adriano, A. A. (2003). In Pursuit of Continuing Quality in Higher Education through Accreditation: the Philippine Experienc. *International Institute for Educational Planning, Paris*.
- Ahmad, A. R. (2013). *The impact of government funding reforms on the strategic planning of Malaysian public universities*. Victoria University.
- Ahmad, A. R., Adi, M., Nazir, M., Md Noor, H., Ng, K. S., & Azizan, A. Z. (2013). An assessment of agency theory in the context of higher education institutions.
- Ahmad, A. R., & Farley, A. (2014). Funding reforms in Malaysian Public Universities from the perspective of strategic planning. *Procedia-Social and Behavioral Sciences*, 129, 105-110.
- Ahmad, A. R., Farley, A., & Naidoo, M. (2012). Analysis of government-university relationship from the perspective of Agency Theory. *Journal of Education and Practice*, 3(6), 12-21.
- Ahmad, A. R., Soon, N. K., & Yee, K. S. (2016). Performance based funding mechanisms: The applicability study in the context of Malaysian public universities. *International Business Management*, 10(17), 3872-3877.

- Ahmad, A. R. F., Alan Naidoo, Moonsamy. (2012). Funding crisis in higher education institutions: Rationale for change. *Asian Economic and Financial Review*, 2(4), 562-576.
- Ahmad, S., & Afthanorhan, W. M. A. B. W. (2014). The importance-performance matrix analysis in partial least square structural equation modeling (PLS-SEM) with smartpls 2.0 M3. *International Journal of Mathematics Research*, 3(1), 1.
- Ahmad, S. H., & Junaid, F. (2008). *A Conceptual Framework for Developing Strategic Partnership between University and Industry in Pakistan with Particular Reference to NWFP*. Paper presented at the Proceedings of 2nd International Conference on Assessing Quality in Higher Education ICAQHE.
- Ahmed, M. (2014). *Sub-Committee of NA Standing Committee on Education Visits HEC. News & Views.*: News & Views.
- Aimran, A. N., Afthanorhan, W., & Razali, N. H. M. (2015). Moderated Mediation Using Partial Least Square Structural Equation Modeling (PLS-SEM).
- Ainuddin, R. A., Beamish, P. W., Hulland, J. S., & Rouse, M. J. (2007). Resource attributes and firm performance in international joint ventures. *Journal of World Business*, 42(1), 47-60.
- Akhtar, M. M. S., & Kalsoom, T. (2012). Issues of Universities' Governance in Pakistan. *Journal of Elementary Education*, 22(2), 81-94.
- Aliabadi, F. J., & Shahri, A. M. (2016). Transparency in Financial Reporting with or without IFRS: The Case of Iran. *World of Accounting Science*, 18.
- Altbach, P. G. (2008). The complex roles of universities in the period of globalization.
- Ameen, K. (2011). Changing scenario of librarianship in Pakistan: managing with the challenges and opportunities. *Library Management*, 32(3), 171-182.
- Anderson, D., Johnson, R., & Milligan, B. (1996). *Performance-Based Funding of Universities. Commissioned Report No. 51*: ERIC.
- Ary, D., Jacobs, L., Sorensen, C., & Walker, D. (2013). *Introduction to research in education*: Cengage Learning.
- Asad, M. M. (2018). *Development of a Novel Knowledge-Based Decision Support System for Accident Prevention of Oil and Gas Drilling Process*. (PhD), Universiti Tun Hussein Onn Malaysia, Malaysia.
- Attila, G. (2012). Agency problems in public sector. *Annals of the University of Oradea*, 21(1).

- Auranen, O., & Nieminen, M. (2010). University research funding and publication performance—An international comparison. *Research Policy*, 39(6), 822-834.
- Aziz, M., Bloom, D. E., Humair, S., Jimenez, E., Rosenberg, L., & Sathar, Z. (2014). Education system reform in Pakistan: why, when, and how? : IZA Policy Paper.
- Bank, T. W. (2006). Pakistan: An Assessment of the Medium-Term Development Framework *Higher Education Policy Note*.
- Barakat, B., Holler, J., Prettnner, K., & Schuster, J. (2010). The impact of the economic crisis on labour and education in Europe: Vienna Institute of Demography Working Papers.
- Barnett, R. (2005). *Reshaping the university: New relationships between research, scholarship and teaching*: McGraw-Hill Education (UK).
- Batool, Z., & Qureshi, R. H. (2007). Quality assurance manual for higher education in Pakistan. *Higher Education Commission, Pakistan*.
- Batool, Z., Qureshi, R. H., & Raouf, A. (2010). Performance evaluation standards for the HEIs. *Higher Education Commission Islamabad*.
- Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical assessment, research & evaluation*, 18.
- Bebczuk, R. N. (2002). R&D Expenditures and the role of government around the world.
- Bell, J. (2014). *Doing Your Research Project: A guide for first-time researchers*: McGraw-Hill Education (UK).
- Bergan, S., Guarga, R., Polak, E. E., Sobrinho, J. D., Tandon, R., & Tilak, J. B. (2009). *Public responsibility for higher education*. Paper presented at the UNESCO World Conference on Higher Education, Paris.
- Bergen, M., Dutta, S., & Walker Jr, O. C. (1992). Agency relationships in marketing: A review of the implications and applications of agency and related theories. *Journal of marketing*, 56(3), 1-24.
- Bernard, H. R., & Bernard, H. R. (2013). *Social research methods: Qualitative and quantitative approaches*: Sage.

- Bertram, D. (2013). Likert Scale is the meaning of life. *Yugoslavia: University of Belgrade*. Recuperado de <http://poincare.matf.bg.ac.rs/~kristina/topic-dane-likert.pdf>.
- Bessire, D. (2005). Transparency: a two-way mirror? *International Journal of Social Economics*, 32(5), 424-438.
- Bilal, H. (2010). *Operations Manual for Finance Division*. Higher Education Commission. Islamabad Pakistan.
- Bilal, M., & Khan, I. (2012). Issues and prospects behind the depressed higher education in Pakistan. *Interdisciplinary journal of contemporary research in business*, 4(7), 157-173.
- Bloch, C., Graversen, E. K., & Pedersen, H. S. (2014). Competitive research grants and their impact on career performance. *Minerva*, 52(1), 77-96.
- Bogue, E. G., & Hall, K. B. (2003). *Quality and accountability in higher education: Improving policy, enhancing performance*: Greenwood Publishing Group.
- Boolaky, P. K., Omoteso, K., Ibrahim, M. U., & Adelopo, I. (2018). The development of accounting practices and the adoption of IFRS in selected MENA countries. *Journal of Accounting in Emerging Economies*, 8(3), 327-351.
- Burke, J. C. (1998). Performance funding: Present status and future prospects. *New Directions for Institutional Research*, 1998(97), 5-13.
- Burke, J. C. (2001). Accountability, Reporting, and Performance: Why Haven't They Made More Difference?
- Burke, J. C. (2002). *Funding public colleges and universities for performance*: SUNY Press.
- Burke, J. C. (2003). Meeting the challenge of change and continuity: Keep what you can, change what you must. Keynote Address at the Conference on Performance Funding in South Carolina.
- Burke, J. C., & Modarresi, S. (2000). To keep or not to keep performance funding: Signals from stakeholders. *The Journal of Higher Education*, 71(4), 432-453.
- Canton, E., Venniker, R., Jongbloed, B. W., Koelman, J., van der Meer, P., & Vossensteyn, J. J. (2001). *Higher education reform: getting the incentives right*. Sdu Uitgevers.

- Carayannis, E. G. (2013). *Encyclopedia of creativity, invention, innovation and entrepreneurship*: Springer Science+ Business Media BV, Formerly Kluwer Academic Publishers BV.
- Carnevale, A. P., Johnson, N. C., & Edwards, A. R. (1998). Performance-based appropriations: Fad or wave of the future. *The Chronicle of Higher Education*, 44(31), B6.
- Chalmers, D., & Fuller, R. (2012). *Teaching for learning at university*: Routledge.
- Chapman, A. (2003). Reflections on a social semiotic approach to discourse analysis in educational research. *Qualitative Educational Research in Action. Doing and Reflecting*. London: RoutledgeFalmer, 152-176.
- Chauhan, C. (2015). Higher Education: Current Status and Future Possibilities in Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. *Analytical Reports in International Education*, 2(1).
- Cheung, B. (2003). higher education financing policy: Mechanisms and Effects. *Essays in Education*, 5(1), 4.
- Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling: JSTOR.
- Chin, W. W. (2010). How to write up and report PLS analyses *Handbook of partial least squares* (pp. 655-690): Springer.
- Cicek, I., Karaboga, T., & Sehitoglu, Y. (2016). A new antecedent of career commitment: work to family positive enhancement. *Procedia-Social and Behavioral Sciences*, 229, 417-426.
- Clark, B. R. (1984). *Perspectives on higher education: Eight disciplinary and comparative views*: Univ of California Press.
- Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The psychologist*, 26(2), 120-123.
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*: Routledge.
- Collins, K. M., Onwuegbuzie, A. J., & Sutton, I. L. (2006). A model incorporating the rationale and purpose for conducting mixed methods research in special education and beyond. *Learning Disabilities: A Contemporary Journal*, 4(1), 67-100.

- Comrey, A. L., & Lee, H. B. (2013). *A first course in factor analysis*: Psychology press.
- Conner, M., Abraham, C., Prestwich, A., Hutter, R., Hallam, J., Sykes-Muskett, B., . . . Hurling, R. (2016). Impact of goal priority and goal conflict on the intention–health-behavior relationship: Tests on physical activity and other health behaviors. *Health Psychology*, 35(9), 1017.
- Conrad, C. (1974). University goals: An operative approach. *The Journal of Higher Education*, 45(7), 504-516.
- Cosmin, I. (2012). 'QQ'-A Two Guitar Band: Quantitative Versus Qualitative Research. *Available at SSRN 1982598*.
- Costello, A., & Osborne, J. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Pract Assess, Res Eval*.
- Creswel, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Los angeles: University of Nebraska–Lincoln.
- Creswell, J. W. (2009). *Mapping the field of mixed methods research*: Sage Publications Sage CA: Los Angeles, CA.
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage publications.
- Creswell, J. W., & Clark, V. L. P. (2007). *Designing and conducting mixed methods research*.
- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*: Sage publications.
- Curtis, B. (2008). The performance-based research fund: Research assessment and funding in New Zealand. *Globalisation, societies and education*, 6(2), 179-194.
- Dar, S., Jabeen, N., Jadoon, Z. I., & Dar, I. S. (2016). Faculty Development Programs and Their Effect on Individual and Organizational Performance in Pakistan. *Pakistan Vision*, 17(2).
- De Coster, I., Forsthuber, B., Oberheidt, S., Parveva, T., & Glass, A. (2008). *Higher Education Governance in Europe: Policies, Structures, Funding and Academic Staff*: ERIC.



- Denscombe, M. (2014). *The good research guide: for small-scale social research projects*: McGraw-Hill Education (UK).
- Denzin, N. K. (2010). Moments, mixed methods, and paradigm dialogs. *Qualitative inquiry*, 16(6), 419-427.
- Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. *MIS quarterly*, 39(2).
- Dill, D., & van Vught, F. (2008). National innovation strategies and the academic research enterprise: Baltimore: Johns Hopkins University Press.
- Dougherty, K. J., & Hong, E. (2006). Performance accountability as imperfect panacea: The community college experience. *Defending the community college equity agenda*, 51-86.
- Dougherty, K. J., & Natow, R. S. (2009). The Demise of Higher Education Performance Funding Systems in Three States. CCRC Working Paper No. 17. *Community College Research Center, Columbia University*.
- Dougherty, K. J., & Reddy, V. (2011). The Impacts of State Performance Funding Systems on Higher Education Institutions: Research Literature Review and Policy Recommendations. CCRC Working Paper No. 37. *Community College Research Center, Columbia University*.
- Eagan Jr, M. K., Hurtado, S., Chang, M. J., Garcia, G. A., Herrera, F. A., & Garibay, J. C. (2013). Making a difference in science education: the impact of undergraduate research programs. *American educational research journal*, 50(4), 683-713.
- Easterby-Smith, M., Thorpe, R., & Jackson, P. (2012). *Management research*: Sage.
- Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological methods*, 5(2), 155.
- Edworthy, E., & Wallis, G. (2008). 14. Research and Development as a Value Creating Asset. *Productivity Measurement and Analysis*, 303.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of management review*, 14(1), 57-74.
- Enders, J., & Fulton, O. (2012). *Higher Education in a Globalising World: International Trends and Mutual Observation A Festschrift in Honour of Ulrich Teichler* (Vol. 1): Springer Science & Business Media.

- F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European Business Review*, 26(2), 106-121.
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological methods*, 4(3), 272.
- Field, A. (2005). *Discovering statistics using SPSS*. Thousand Oaks, CA, US: Sage Publications, Inc.
- Finkle, A. (2005). Relying on information acquired by a principal. *International Journal of Industrial Organization*, 23(3-4), 263-278.
- Folkestad, B. (2008). *Analysing Interview Data*.
- Fraumeni, B. M., & Okubo, S. (2005). R&D in the national income and product accounts: A first look at its effect on GDP *Measuring capital in the new economy* (pp. 275-322): University of Chicago Press.
- GaE, J. G. (1975). *Toward Faculty Renewal: Advances in Faculty, Instructional, and Organizational Development*: San Francisco: Jossey-Bass.
- Gardner, W. L., & Martinko, M. J. (1988). Impression management: An observational study linking audience characteristics with verbal self-presentations. *Academy of Management Journal*, 31(1), 42-65.
- Gauld, R. (2007). Principal-agent theory and organisational change: lessons from New Zealand health information management. *Policy Studies*, 28(1), 17-34.
- Gautier, A., & Wauthy, X. (2007). Teaching versus research: A multi-tasking approach to multi-department universities. *European Economic Review*, 51(2), 273-295.
- Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, 61(1), 101-107.
- Geuna, A., & Martin, B. R. (2003). University research evaluation and funding: An international comparison. *Minerva*, 41(4), 277-304.
- Gillham, B. (2008). *Developing a questionnaire*: A&C Black.
- Gliem, J. A., & Gliem, R. R. (2003). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales*.
- GOP. (2009-2010). *Financial Scenario, Pakistan Economic Survey*. Islamabad: Government of Pakistan.



- GOP. (2011-2012). *Financial Scenario of HEC, Chapter 10 of Pakistan Economic Survey*. Government of Pakistan.
- GOP. (2012-2013). *Research and Development Economic Adviser's Wing, Finance Division, Government of Pakistan, Islamabad*. Government of Pakistan.
- GOP. (2013-2014). *Research and Development Economic Adviser's Wing, Finance Division, Government of Pakistan, Islamabad*. Government of Pakistan
- GOP. (2014-2015). *Financial Scenario, Pakistan Economic Survey*. Islamabad Government of Pakistan.
- Gornitzka, Å., Stensaker, B., Smeby, J. C., & De Boer, H. (2004). Contract arrangements in the Nordic countries—solving the efficiency/effectiveness dilemma? *Higher Education in Europe*, 29(1), 87-101.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, 2(163-194).
- Haider, S. Z. (2008). Challenges in higher education: Special reference to Pakistan and South Asian developing countries. *Nonpartisan Education Review/Essays*, 4 (2).
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). Multivariate data analysis 6th Edition. Pearson Prentice Hall. New Jersey. humans: Critique and reformulation. *Journal of Abnormal Psychology*, 87, 49-74.
- Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*, 117(3), 442-458.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis: Pearson new international edition*: Pearson Higher Ed.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, 19(2), 139-152.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long range planning*, 46(1-2), 1-12.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the academy of marketing science*, 40(3), 414-433.

- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage publications.
- Hanushek, E., & Lindseth, A. (2009). Performance-based funding. *Education Week*, 28, 28.
- Haq, R. (2017). Govt slashes HEC's development budget by over 50%, *The Express Tribune*. July 2.
- Harnisch, T. L. (2011). Performance-based funding: A re-emerging strategy in public higher education financing. *Washington, DC: American Association of State Colleges and Universities*, 1-12.
- Harvey, K. L. (2009). SPSS Survival Manual: A step-by-step guide to data analysis using SPSS version 15. *Nurse Researcher*, 16(3), 89-90.
- Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, 67(3), 451-470.
- HEC. (2002-2003). *Annual Report, Financial Operations*. Islamabad Pakistan.
- HEC. (2005-2006). *Annual Report, Financial Operations*. Islamabad Pakistan.
- HEC. (2011a). Retrieved, <http://www.hec.gov.pk/MediaPublication/Pages/Mainpage.aspx>.
- HEC. (2011b). [www.hec.gov.pk/InsideHEC/Divisions/HRD/.../PressRelease.aspx](http://www.hec.gov.pk/InsideHEC/Divisions/HRD/.../PressRelease.aspx). Press Release
- HEC. (2011-2015). *Medium Term Development Framework-HE II. Higher Education Commission*. Islamabad Pakistan.
- HEC. (2013a). [gov.pk/insidehec/divisions/.../recurringbudge.aspx](http://www.hec.gov.pk/insidehec/divisions/.../recurringbudge.aspx).
- HEC. (2013b). *Proposed Funding Policy to Public Sector Higher Education Institutions in Pakistan*. Higher Education Commission, Islamabad, Pakistan Islamabad Pakistan.
- HEC. (2014). *Annual Report, Financial Operations*. Islamabad Pakistan.
- HEC. (2016). <http://www.hec.gov.pk/english/universities/pages/recognised.aspx>.
- HEC. (2017). *R&D Programs and Support Initiatives Policy Handbook*. Islamabad Pakistan.
- Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Industrial Management & Data Systems*, 116(1), 2-20.

- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43(1), 115-135.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing *New challenges to international marketing* (pp. 277-319): Emerald Group Publishing Limited.
- Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computational Statistics*, 28(2), 565-580.
- Herani, G. M., Mugheri, M. S., & Advani, A. (2015). Measuring the endeavors' Impact of Quality Enhancement Cell on Quality of Higher Education system in Pakistan. A case of Private and Public Universities in Pakistan. *Journal of Management for Global Sustainable Development*, 1(1), 37-39.
- Heyvaert, M., Maes, B., & Onghena, P. (2013). Mixed methods research synthesis: definition, framework, and potential. *Quality & Quantity*, 47(2), 659-676.
- Hoodbhoy, P. (1998). Pakistani Universities—Which Way Out. *Education and the State: Fifty Years of Pakistan*, 50, 251.
- Horta, H., Huisman, J., & Heitor, M. (2008). Does competitive research funding encourage diversity in higher education? *Science and public policy*, 35(3), 146-158.
- Hoskisson, R. E., Castleton, M. W., & Withers, M. C. (2009). Complementarity in monitoring and bonding: More intense monitoring leads to higher executive compensation. *Academy of Management Perspectives*, 23(2), 57-74.
- Hou, A. Y.-C. (2011). Quality assurance at a distance: international accreditation in Taiwan higher education. *Higher education*, 61(2), 179-191.
- Huenneke, L. F., Stearns, D. M., Martinez, J. D., & Laurila, K. (2017). Key strategies for building research capacity of university faculty members. *Innovative higher education*, 42(5-6), 421-435.
- Huisman, J., Meek, L., & Wood, F. (2007). Institutional diversity in higher education: A cross-national and longitudinal analysis. *Higher Education Quarterly*, 61(4), 563-577.
- Iqbal, M., & Iqbal, M. Z. (2011). Educational Leadership for Managing Quality: Problems, Issues, and Ethical Behavior. *International Journal of Humanities and Social Sciences*, 1(14), 165-169.

- Jackson, C. J., & Furnham, A. (2000). Designing and analysing questionnaires and surveys A manual for health professionals and administrators.
- Jacobs, B., & Van Der Ploeg, F. (2006). Guide to reform of higher education: a European perspective. *Economic Policy*, 21(47), 536-592.
- Jenner, B., Flick, U., von Kardoff, E., & Steinke, I. (2004). *A companion to qualitative research*: Sage.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.
- Jin, J. C., & Jin, L. (2014). On the relationship between university education and economic growth: the role of professors' publication. *Education Economics*, 22(6), 635-651.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7), 14-26.
- Johnson, W. B. (2002). The intentional mentor: Strategies and guidelines for the practice of mentoring. *Professional psychology: Research and practice*, 33(1), 88.
- Jones, D. (1984). Higher-Education Budgeting at the State Level: Concepts and Principles, Boulder. CO: National Center for Higher Education Management Systems.
- Jongbloed, B. (2000). The funding of higher education in developing countries. *Management and policy in higher education*, 32, 13-42.
- Jongbloed, B. (2006). Strengthening consumer choice in higher education. In T.N.Pedro, J. D. Bruce. *Cost-Sharing and Accessibility in Higher Education: A Fairer Deal?* New york: Springer, (pp. 19-50).
- Jongbloed, B. (2008). Funding higher education: a view from Europe. *Center for Higher Education Policy Studies*.
- Jongbloed, B. (2010). *Funding higher education: a view across Europe*. Brussels, ESMU.
- Jongbloed, B., & Vossensteyn, H. (2001). Keeping up performances: An international survey of performance-based funding in higher education. *Journal of Higher Education Policy and Management*, 23(2), 127-145.

- Julien, P. A., & Ramangalahy, C. (2003). Competitive strategy and performance of exporting SMEs: An empirical investigation of the impact of their export information search and competencies. *Entrepreneurship Theory and Practice*, 27(3), 227-245.
- Kapellas, K., & Siougle, G. (2018). The Effect of IFRS Adoption on Investment Management: A Review of the Literature. *Technology and Investment*, 9(1), 1-23.
- Kenny, D. (2016). *Learn how you can do a mediation analysis and output a text description of your results: Go to mediational analysis using DataToText using SPSS or R.*
- Khan, A. A. (2010). Pakistan: Politics, not floods, divert university funds. from University world news. <http://www.universityworldnews.com/article.php>.
- Khan, G., & Bhatti, R. (2016). The impact of higher education commission of pakistan's funding on the collection development budgets of university libraries. *The Bottom Line*, 29(1), 12-24.
- Khan, G., Bhatti, R., & Eden, B. L. (2016). The Impact of Higher Education Commission of Pakistan's Funding on the Collection Development Budgets of University Libraries. *The Bottom Line*, 29(1).
- Khan, S. B., & Anwar, S. (2013). University-industry partnership for development of knowledge. *Asian journal of social sciences & humanities*, 2(2), 268-274.
- Khattak, N. U. R. K., Khan, J., Khan, I., & Tariq, M. (2012). An Analysis of the Demand for Higher Education in Pakistan with Special Reference to Khyber Pakhtunkhwa.
- Kivistö, J. (2005). The government-higher education institution relationship: Theoretical considerations from the perspective of agency theory. *Tertiary Education & Management*, 11(1), 1-17.
- Kivistö, J. (2007). *Agency theory as a framework for the government-university relationship*: Tampere University Press.
- Kivistö, J. (2008). An assessment of agency theory as a framework for the government–university relationship. *Journal of Higher Education Policy and Management*, 30(4), 339-350.
- Kivistö, J., & Hölttä, S. (2008). Information as a regulative element in higher education systems. *Tertiary Education and Management*, 14(4), 331-344.

- Kivistö, J., & Kohtamäki, V. (2015). *Impacts of performance-based funding on higher education institutions: A literature review*. Paper presented at the EAIR 37th Annual Forum in Krems, Austria.
- Klein, S. (2005). Performance-Based Funding in Adult Education: Literature Review and Theoretical Framework: Sept.
- Kline, P. (1994). *A general description of factor analysis*. An Easy Guide to Factor Analysis: New York.
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*: Guilford publications.
- Kofar-Sauri Bello Garba, Abd Rahman Ahmad, & Bappah, N. K. S. a. A. S. (2016). Government Higher Education Institutions Relationship Vide the Lens of the Principal-Agent Theory.
- Kofar-Sauri, B. G. (2018). *Relationship between the National Universities Commission Resource Allocation Parameters used in Allocating Funds to Teaching and Learning and Research and Development and the Outcomes of Federal Universities in Nigeria*. Universiti Tun Hussein Onn Malaysia, Malaysia.
- Kok, W. (2004). *Facing the challenge [Recurso electrónico]: the Lisbon strategy for growth and employment/report of the High Level Group chaired by Wim Kok*.
- Kothari, C. R. (2011). *Research methodology: methods and techniques*: New Age International.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610.
- Kreuger, L., & Neuman, W. L. (2006). *Social work research methods: qualitative and quantitative approaches: with Research Navigator*: Pearson/Allyn and Bacon.
- Kuh, G. D. (2008). Excerpt from high-impact educational practices: What they are, who has access to them, and why they matter. *Association of American Colleges and Universities*, 19-34.
- Kumar, V. (2017). *The role of university research centers in promoting research*: Springer.
- Lambert, R. A. (2001). Contracting theory and accounting. *Journal of accounting and economics*, 32(1-3), 3-87.



- Lane, J. E., & Kivisto, J. A. (2008). Interests, information, and incentives in higher education: Principal-agent theory and its potential applications to the study of higher education governance *Higher education* (pp. 141-179): Springer.
- Lang, D. W. (2005). The political economy of performance funding. *Taking public universities seriously*, 226-250.
- Larsen, M. T. (2011). The implications of academic enterprise for public science: An overview of the empirical evidence. *Research Policy*, 40(1), 6-19.
- Layzell, D. T. (2007). State higher education funding models: An assessment of current and emerging approaches. *Journal of Education Finance*, 1-19.
- Lee, S. S., Dong, C., Yeo, S. P., Gwee, M. C., & Samarasekera, D. D. (2018). Impact of faculty development programs for positive behavioural changes among teachers: a case study. *Korean journal of medical education*, 30(1), 11.
- Lepori, B., Benninghoff, M., Jongbloed, B., Salerno, C., & Slipersaeter, S. (2007). Changing models and patterns of higher education funding: some empirical evidence. *Universities and strategic knowledge creation. Cheltenham: Edward Elgar*, 85-111.
- Leruth, M. L. E., & Paul, E. (2006). A principal-agent theory approach to public expenditure management systems in developing countries: International Monetary Fund.
- Li, K.-K., & Chan, D. K.-S. (2008). Goal conflict and the moderating effects of intention stability in intention-behavior relations: Physical activity among Hong Kong Chinese. *Journal of Sport and Exercise Psychology*, 30(1), 39-55.
- Li, S., Sougiannis, T., & Wang, I. (2017). Mandatory IFRS Adoption and the Usefulness of Accounting Information in Predicting Future Earnings and Cash Flows.
- Liefner, I. (2003). Funding, resource allocation, and performance in higher education systems. *Higher education*, 46(4), 469-489.
- Little, T. D. (2013). *Longitudinal structural equation modeling*: Guilford press.
- Lodhi, A. S. (2012). A pilot study of researching the research culture in Pakistani public universities: the academics' perspective. *Procedia-Social and Behavioral Sciences*, 31, 473-479.
- Lorelle Frazer, L., & Lawley, M. (2000). *Questionnaire Design & Administration: a practical guide*. Brisbane: New York: John Wiley & Sons Australia.

- Lungu, C. I., Caraiani, C., & Dascălu, C. (2017). The impact of IFRS adoption on foreign direct investments: Insights for Emerging Countries. *Accounting in Europe, 14*(3), 331-357.
- Mac Naughton, G., Rolfe, S., & Siraj-Blatchford, I. (2010). *Doing early childhood research*: McGraw-Hill Education (UK).
- Mackenzie, N., & Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. *Issues in educational research, 16*(2), 193-205.
- Mahr Muhammad Saeed Akhtar, Muhammad Shaban Rafi, Shehzad Ahmed, & Rauf, M. (2012). Quality in Higher Education: Issues and Current Practices *Journal of Elementary Education, 21*(1), 43-51.
- Malik, M. E., Nawab, S., Naeem, B., & Danish, R. Q. (2010). Job satisfaction and organizational commitment of university teachers in public sector of Pakistan. *International journal of business and management, 5*(6), 17.
- Malolos, C. F., & Tullao Jr, T. S. (2018). Role of the Commission on Higher Education in Promoting Quality Education.
- Masood, K., Safdar, M., Hussain, M. A., & Ahmed, A. (2013). Enhancing Quality and Quantity of Higher Education Through Information and Communication Technologies.
- Massy, W. (1996). *Resource allocation in higher education*: University of Michigan Press.
- Massy, W. F. (2003). *Honoring the Trust: Quality and Cost Containment in Higher Education*: ERIC.
- Matthews, B., & Ross, L. (2014). *Research methods*: Pearson Higher Ed.
- McCann, A. L., & Schneiderman, E. D. (2019). Creating a Supportive Educational Research Culture at a Dental School by Identifying Obstacles and Solutions. *Journal of dental education, 83*(3), 265-274.
- McDaniel, O. C. (1996). The paradigms of governance in higher education systems. *Higher Education Policy, 9*(2), 137-158.
- McKelvie, B. D. (1986). The University's statement of goals. *Higher education, 15*(1-2), 151-163.
- McLendon, M. K., Hearn, J. C., & Deaton, R. (2006). Called to account: Analyzing the origins and spread of state performance-accountability policies for higher education. *Educational Evaluation and Policy Analysis, 28*(1), 1-24.



- McLendon, M. K., & Ness, E. C. (2003). The politics of state higher education governance reform. *Peabody journal of education*, 78(4), 66-88.
- McLeod, H. (2011). South Carolina Moves to Define Performance-Based Funding Formula for Higher Education. *Diverse: Issues in Higher Education*, 28(4), 8-8.
- Memon, J. A., Sajid, A., & Qureshi, M. (2008). *Quality Assessment of Academic Initiatives for Higher Education Research in Pakistan*. Paper presented at the 11th QMOD Conference. Quality Management and Organizational Development Attaining Sustainability From Organizational Excellence to SustainAble Excellence; 20-22 August; 2008 in Helsingborg; Sweden.
- Miao, K. (2012). Performance-Based Funding of Higher Education: A Detailed Look at Best Practices in 6 States. *Center for American Progress*.
- Miller, G. J., Robbins, D., & Keum, J. (2007). Incentives, Certification, and Targets in Performance Budgeting. *Public Performance & Management Review*, 30(4), 469-495.
- Morales, D. X., Grineski, S. E., & Collins, T. W. (2017). Faculty motivation to mentor students through undergraduate research programs: a study of enabling and constraining factors. *Research in higher education*, 58(5), 520-544.
- Munro, L. (1999). A principal-agent analysis of the family: Implications for the welfare state.
- Mutiso, J. M., Onyango, M., & Nyagol, M. (2015). Effects of Funding Sources on Access to Quality Higher Education in Public Universities in Kenya: A Case Study. *International Journal of Business and Social Research*, 5(3), 68-81.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13(2), 187-221.
- Naqvi, S. (2005). *Overview of Higher Education Commission (HEC) support for academia in Pakistan*.
- Nedwek, B. (1996). Public policy and public trust: The use and misuse of performance indicators in higher education. *Higher Education-New York-Agathon Press Incorporated*, 11, 47-89.
- Newman, F., Couturier, L., & Scurry, J. (2010). *The future of higher education: Rhetoric, reality, and the risks of the market*: John Wiley & Sons.

- Nguyen, H. C., & Ta, T. T. H. (2018). Exploring impact of accreditation on higher education in developing countries: a Vietnamese view. *Tertiary Education and Management*, 24(2), 154-167.
- Nik Ahmad Nik, N. (2019). Revenue diversification in public higher learning institutions: an exploratory Malaysian study. *Journal of Applied Research in Higher Education*, 11(3), 379-397. doi: 10.1108/JARHE-04-2018-0057
- Noor, S., Ismail, K., & Arif, A. (2014). Academic research commercialization in Pakistan: Issues and challenges. *Jurnal Kemanusiaan*, 12(1).
- OECD, F. M. (2002). Proposed Standard Practice for Surveys on Research and Experimental Development. *The Measurement of Scientific and Technological Activities Series. Paris*.
- Okebukola, P., & Shabani, J. (2007). Quality assurance and accreditation in higher education in Sub-Saharan Africa. *Higher education in the world*, 188-200.
- Onwuegbuzie, A. J., & Leech, N. L. (2005). On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International journal of social research methodology*, 8(5), 375-387.
- Osagie, R. O. (2012). Federal Government Funding of Research in Universities in Nigeria, the University of Benin as a Case Study. *International Education Studies*, 5(6), 73-79.
- Osunde, A., & Omoruyi, F. (2004). An Evaluation of the National Teachers' Institute's Manpower Training Program for Teaching Personnel in Mid-Western Nigeria. *Australian Journal of Adult Learning*, 44(1), 95-104.
- Pakistan, E. C. (2008). Retrieved, <http://app.hec.gov.pk/rnd/rnd.htm>.
- Pallant, J. (2013). *SPSS survival manual*: McGraw-Hill Education (UK).
- Parveen, A., Rashid, K., Iqbal, M. Z., & Khan, S. (2011). System and reforms of higher education in Pakistan. *International Journal of Business and Social Science*, 2(20).
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Sage Publications. Thousand Oaks.
- Pavlakakis, A., & Kelley, C. (2016). Accreditation in the professions: Implications for educational leadership preparation programs. *Journal of Research on Leadership Education*, 11(1), 68-90.
- Perrow, C. (1993). Complex organizations; a critical essay.

- Perry, C., Riege, A., & Brown, L. (1999). Realism's role among scientific paradigms in marketing research. *Irish Marketing Review*, 12(2), 16-23.
- Petrella, J. K., & Jung, A. P. (2008). Undergraduate research: Importance, benefits, and challenges. *International journal of exercise science*, 1(3), 91.
- Pettigrew, A. (1973). *The Politics of Organisational Decision-Making*, London. England: Tavistock.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*: Stanford University Press.
- Phillips, T. R. (2003). Keynote Address: Electoral Accountability and Judicial Independence. *Ohio St. LJ*, 64, 137.
- Picón, A., Castro, I., & Roldán, J. L. (2014). The relationship between satisfaction and loyalty: A mediator analysis. *Journal of Business Research*, 67(5), 746-751.
- Pituch, K. A., & Stevens, J. P. (2015). *Applied multivariate statistics for the social sciences: Analyses with SAS and IBM's SPSS*: Routledge.
- Presseau, J., Francis, J. J., Campbell, N. C., & Sniehotta, F. F. (2011). Goal conflict, goal facilitation, and health professionals' provision of physical activity advice in primary care: An exploratory prospective study. *Implementation Science*, 6(1), 73.
- Presseau, J., Sniehotta, F. F., Francis, J. J., & Gebhardt, W. A. (2010). With a little help from my goals: Integrating intergoal facilitation with the theory of planned behaviour to predict physical activity. *British Journal of Health Psychology*, 15(4), 905-919.
- Presseau, J., Tait, R. I., Johnston, D. W., Francis, J. J., & Sniehotta, F. F. (2013). Goal conflict and goal facilitation as predictors of daily accelerometer-assessed physical activity. *Health Psychology*, 32(12), 1179.
- Pricope, C. F. (2017). The implications of IFRS adoption on foreign direct investment in poor countries. *The Audit Financiar journal*, 15(146), 218-218.
- Rabovsky, T. M. (2012). Accountability in higher education: Exploring impacts on state budgets and institutional spending patterns. *Journal of Public Administration Research and Theory*, 22(4), 675-700.
- Ramayah, T., Cheah, J., Chuah, F., Ting, H., & Memon, M. A. (2016). *Partial least squares structural equation modeling (PLS-SEM) using SmartPLS 3.0: An updated and practical guide to statistical analysis*: Pearson Singapore.

- Rasheed, M. I., Aslam, H. D., & Sarwar, S. (2010). Motivational issues for teachers in higher education: A critical case of IUB. *Journal of Management Research*, 2(2), 1.
- Rasli, A., & Kowang, T. O. (2017). *Universities innovation and technology commercialization challenges and solutions from the perspectives of Malaysian research universities*. Paper presented at the AIP Conference Proceedings.
- Reddy, K., Xie, E., & Tang, Q. (2016). Higher education, high-impact research, and world university rankings: A case of India and comparison with China. *Pacific Science Review B: Humanities and Social Sciences*, 2(1), 1-21.
- Rehman, H., & Khan, N. (2012). Flaws in Pakistan's Educational System. *Abasyn University Journal of Social Sciences*, 4(1).
- Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2018). Partial least squares structural equation modeling in HRM research. *The International Journal of Human Resource Management*, 1-27.
- Ringle, C. M., Wende, S., & Will, A. (2005). SmartPLS 2.0 (beta): Hamburg.
- Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative science quarterly*, 150-163.
- Robbins, C. (2013). *Linking Frascati-based R&D Spending to the System of National Accounts*: BiblioGov.
- Rönkkö, M., & Evermann, J. (2013). A critical examination of common beliefs about partial least squares path modeling. *Organizational Research Methods*, 16(3), 425-448.
- Rostami, A., Gabler, C., & Agnihotri, R. (2019). Under pressure: The pros and cons of putting time pressure on your salesforce. *Journal of Business Research*, 103, 153-162.
- Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data*: Sage.
- Rungfamai, K. (2008). Higher education and institutional-autonomy policy in Thailand: The perspective of Agency Theory.
- Saam, N. J. (2007). Asymmetry in information versus asymmetry in power: Implicit assumptions of agency theory? *The Journal of Socio-Economics*, 36(6), 825-840.

- Safdar, M., Baloch, I. H., & Nfees, M. (2013). Bridging Digital Divide: A Step Towards Excellence in Higher Education in Pakistan.
- Sanford, T., & Hunter, J. M. (2011). Impact of performance funding on retention and graduation rates. *education policy analysis archives*, 19, 33.
- Sanyal, B. C., & Martin, M. (2009). Financing higher education: International perspectives. *World*, 68(110,731), 23.22.
- Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). Partial least squares structural equation modeling. *Handbook of market research*, 1-40.
- Saunders, M. N., Saunders, M., Lewis, P., & Thornhill, A. (2011). *Research methods for business students*, 5/e: Pearson Education India.
- Savenije, B. (1992). University budgeting: Creating incentives for change? *Research in higher education*, 33(5), 641-656.
- Schiller, D., & Liefner, I. (2007). Higher education funding reform and university–industry links in developing countries: The case of Thailand. *Higher education*, 54(4), 543-556.
- Schmidt, P. (2002). Most States Tie Aid to Performance, Despite Little Proof That It Works. *Chronicle of Higher Education*, 48(24).
- Schultz, P. W., Hernandez, P. R., Woodcock, A., Estrada, M., Chance, R. C., Aguilar, M., & Serpe, R. T. (2011). Patching the pipeline: Reducing educational disparities in the sciences through minority training programs. *Educational Evaluation and Policy Analysis*, 33(1), 95-114.
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*: John Wiley & Sons.
- Shanks, S. (2006). Econometric Modelling of R&D and Australia's Productivity-Productivity Commission Staff Working Paper.
- Shin, J.-C., & Milton, S. (2004). The Effects of Performance Budgeting and Funding Programs on Graduation Rate in Public Four-Year Colleges and Universities. *education policy analysis archives*, 12(22), n22.
- Shin, J. C. (2009). Classifying higher education institutions in Korea: A performance-based approach. *Higher education*, 57(2), 247-266.
- Siddiqui, Z. (2009). Faculty development: A step towards quality and excellence. *Journal of Quality and Technology Management*, 5(2), 17-26.

- Slocum Jr, J. W., Cron, W. L., & Brown, S. P. (2002). The effect of goal conflict on performance. *Journal of Leadership & Organizational Studies*, 9(1), 77-89.
- Smart, J. C. (2008). *Higher education: Handbook of theory and research* (Vol. 23): Springer.
- Smith, P. C., & Goddard, M. (2002). Performance management and Operational Research: a marriage made in heaven? *Journal of the Operational Research Society*, 53(3), 247-255.
- Soguel, N. C., & Jaccard, P. (2008). *Governance and performance of education systems*: Springer.
- Soo.M. (2003). The impact of performance based funding schemes on universities' behavior (A preliminary research plan). Chapel Hill: University of North Carolina. Retrieved from <http://www.utwente.nl/cheps/documenten/susu2003/soo.pdf>.
- Stone, M. (1974). Cross-validators choice and assessment of statistical predictions. *Journal of the Royal Statistical Society: Series B (Methodological)*, 36(2), 111-133.
- Strehl, F., Reisinger, S., & Kalatschan, M. (2007). Funding Systems and their Effects on Higher Education Systems. OECD Education Working Papers, No. 6. *OECD Publishing (NJI)*.
- Subhani, M. I., Hasan, S. A., Osman, A., & Sheikh, F. (2012). Evil Act: Politics Domination in Higher Education Universities (Empirical Evidence from Pakistan).
- Syed Ather Hussain Akbari, & Naqvi, S. N. H. (2008). *The Demand for Higher Education Old and New Challenges. News & Views*. Islamabad Pakistan.
- Symaco, L. P. (2013). Education in the knowledge-based society: the case of the Philippines. *Asia Pacific Journal of Education*, 33(2), 183-196.
- Tabachnick, B. G., & Fidell, L. S. (2013). Using multivariate statistics, 6th edn Boston. *Ma: Pearson*.
- Taherdoost, H., Sahibuddin, S., & Jalaliyoon, N. (2014). Evaluation of Security Factors Effecting on Web-Based Service Adoption. *Recent Advances in Telecommunications, Informatics and Educational Technologies*, 117-123.



- Taylor, P. (2005). Do public sector contract catering tender procedures result in an auction for “lemons”? *International Journal of Public Sector Management*, 18(6), 484-497.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*: Sage.
- Tenenhaus, M., Amato, S., & Esposito Vinzi, V. (2004). *A global goodness-of-fit index for PLS structural equation modelling*. Paper presented at the Proceedings of the XLII SIS scientific meeting.
- Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M., & Lauro, C. (2005). PLS path modeling. *Computational statistics & data analysis*, 48(1), 159-205.
- Thomas, H. G. (2001). Funding mechanism or quality assessment: Responses to the research assessment exercise in English institutions.
- Ticehurst, G. W., & Veal, A. J. (2000). *Business research methods: A managerial approach*: Addison Wesley Longman.
- Ting, S.-C., Chen, C.-N., & Bartholomew, D. E. (2007). An integrated study of entrepreneurs' opportunism. *Journal of Business & Industrial Marketing*, 22(5), 322-335.
- Todea, N., & Tilea, D. M. (2011). Comparative analysis between the models for financing of education in Romania and the United Kingdom. *Procedia-Social and Behavioral Sciences*, 15, 717-721.
- Tullao Jr, T. S. (2001). Domestic regulation and the trade in services: the role of the commission on higher education (CHED) and the professional regulation commission (PRC). *Education & Globalization*, 17.
- Ugwu, J. I., & Okoye, E. I. (2018). Accounting for the effect of foreign direct investment on economic growth, post IFRS adoption in selected Sub-Saharan African countries (1999-2015). *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 8(2), 73-94.
- UNESCO. (2009). The impact of the global financial and economic crisis on the education sector, UNESCO, Paris.
- Van Slyke, D. M. (2007). Agents or stewards: Using theory to understand the government-nonprofit social service contracting relationship. *Journal of Public Administration Research and Theory*, 17(2), 157-187.

- Venaik, S., Midgley, D. F., & Devinney, T. M. (2005). Dual paths to performance: The impact of global pressures on MNC subsidiary conduct and performance. *Journal of International Business Studies*, 36(6), 655-675.
- Vinzi, V. E., Chin, W. W., Henseler, J., & Wang, H. (2010). *Handbook of partial least squares* (Vol. 201): Springer.
- Wächter, B., Kelo, M., Lam, Q., Effertz, P., Jost, C., & Kottowski, S. (2015). University quality indicators: a critical assessment. *European Parliament, European Parliament's Committee on Culture and Education*.
- Walsh, M. (2003). Teaching qualitative analysis using QSR NVivo. *The Qualitative Report*, 8(2), 251-256.
- Washburn, J. (2008). *University, Inc.: The corporate corruption of higher education*: Basic Books.
- Williams, B., Onsman, A., & Brown, T. (2012). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, 8(3).
- Williams, J. (2016). Quality assurance and quality enhancement: is there a relationship? : Taylor & Francis.
- Williford, K., & Small, D. (2013). Establishing an effective compliance program: An overview to protecting your organization. *Association of Corporate Counsel*.
- Yarmolinski, A. (2012). *Agency Theory in Higher Education Organizations*. The Organization of Higher Education: Managing Colleges for a New Era. 278.
- Yee, K. S. (2019). *The Applicability of Performance-Based Funding Mechanisms in Malaysian Public Universities*. Universiti Tun Hussein Onn Malaysia, Malaysia.
- Yousefinejad, M., Ahmad, A., Salleh, F. M., Rahim, R. A., & Azam, H. M. (2018). The Mediating Effect of Information Asymmetry on IFRS and Foreign Direct Investment. *International Journal of Economics and Management*, 12(2), 641-656.
- Yusuf, A. (2012). An appraisal of research in Nigeria's university sector. *J Res Natl Dev*, 10, 321-330.
- Zaheer, M., & Zia, Y. A. (2013). Perceived Effectiveness of Foreign Scholarship Schemes for Faculty Development offered by Higher Education Commission of Pakistan. *PUTAJ-Humanities and Social Sciences*, 20(1`), 265–272-265–272.



- Zaidi, S., & Paz, V. (2015). The Impact of IFRS Adoption: A Literature Review. *Journal of Theoretical Accounting Research*, 10(2).
- Zhai, J., & Wang, Y. (2016). Accounting information quality, governance efficiency and capital investment choice. *China Journal of Accounting Research*, 9(4), 251-266.
- Zikmund, W., Babin, B., Carr, J., & Griffin, M. (2012). *Business research methods*: Cengage Learning.
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods*: Nelson Education.
- Zong, F., & Wang, L. (2017). Evaluation of university scientific research ability based on the output of sci-tech papers: A D-AHP approach. *PloS one*, 12(2), e 0171437.



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PERPUSTAKAAN TUNKU TUN AMINAH